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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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4586 7590 12/16/2004

ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043

EXAMINER

LE, VU

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
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2613

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/642,396 | ZHAO ET AL. | |
| | Examiner | Art Unit | |
| | Vu Le | 2613 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3-15-04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 13-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 13-14 pertains to a computer per se, and not a series of steps to be performed on a computer. Claim can be remedied by amending the preamble to recite "A computer program embodied in a tangible medium comprising module with instructions, when executed by a computer...". For the purpose of prior art rejection, Examiner will examine the merits of claims 13-14 with the assumption that claims 13-14 will be amended as recommended.

Claim Objections

3. Claims 9, 12 and 14 are objected to because of the following informalities:

In these claims, the term "L1-norm" lacks proper antecedent basis and needs to be defined. See claim 2. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –
(e) the invention was described in –
(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent; or

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(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English.

4. Claims 1-9, 11-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu et al, US 2003/0156646.

Re claim 1, Hsu et al discloses the same method of selecting a mode for the encoding of a macroblock in a video encoder (figs. 7, 9), the method comprising:

performing a motion search to select a motion vector (710);

determining a residual error for the motion vector with a plurality of macroblock modes (745 i.e. subtractor, also para. 0075, 0081; macroblock modes are intra, inter and bi-directional predictive);

estimating a coding cost from motion vectors for at least some of the plurality of macroblock modes (para. 0125-0128);

and selecting the mode for the encoding of the macroblock based on both the residual error and the coding cost associated with the mode (para 0075, 0081, 0126).

Re claim 2, the method as defined in claim 1, wherein the residual error is computed according to a sum of absolute differences (SAD) calculation (L1-norm). (See para. 0119).

Re claim 3, the method as defined in claim 1, wherein the residual error is computed according to a sum of squares calculation (L2-norm). (See para. 0119 i.e., "MSE").

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Re claim 4, the method as defined in claim 1, wherein the coding cost for an inter macroblock with zero motion vector is zero. (It is inherent in Hsu et al that during predictive coding mode i.e., inter-macroblock, a zero motion vector indicates no change between the current and previous macroblocks, so coding is not required).

Re claim 5, the method as defined in claim 1, further comprising using different criteria to calculate the coding cost depending on whether the picture is a B-picture or is a P-picture. (See para. 0082, also it is inherent in Hsu et al that P-predictive picture and B-predictive picture will require different coding cost and coding parameters or criteria).

Re claim 6, the method as defined in claim 1, further comprising using different criteria to calculate the coding cost depending on whether the picture is interleaved or is progressive. (It is inherent in Hsu et al that interleaved or interlaced picture and progressive picture will require different coding cost and coding parameters or criteria because interlaced picture implies correlation between fields in a single frame whereas progressive pictures implies correlation between frames).

Re claim 7, "A method of selecting a mode for the encoding of a macroblock (MB) in a video encoder, the method comprising using both an indication for residual error and a coding cost for a motion vector for a mode to determine which mode is selected for the macroblock." (Claim 7 has been analyzed and rejected w/r to claim 1).

Re claim 8, the method as defined in claim 7, wherein the motion vector (MV) is a differential motion vector (DMV). (See para 0116).

Re claim 9, the method as defined in Claim 7, wherein the residual error is at least partially computed by reusing an L1-norm calculation from a motion search. (See para 0119. Also, it is inherent Hsu et al that for each of the motion vectors evaluated during motion estimation i.e. SAD computation, the previous SAD result is "resused" to determined the minimum SAD, thus resulting in the best match motion vector).

Re claim 11, "A video encoder that is configured to select a mode for the encoding of a macroblock (MB), the video encoder comprising means for using both an indication for residual error and a coding cost for a motion vector for a mode to determine which mode is selected for the macroblock." (Claim 11 has been analyzed and rejected w/r to claim 1. Fig. 7 illustrates the video encoder as claimed).

Re claim 12, see discussion w/r to claim 9.

Re claim 13, "A computer program embodied in a tangible medium comprising a module with instructions for selecting a mode for the encoding of a macroblock (MB), the computer program including instructions for using both an indication for residual error and a coding cost for a motion vector for a mode to determine which mode is selected for the macroblock." (Claim 13 has been analyzed and rejected w/r to claim 1. Fig. 6 illustrates a computer system with computer program).

Re claim 14, see discussion w/r to claim 9.

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Re claim 15, "A circuit configured to select a mode for the encoding of a macroblock in a rate and quality efficient manner, the circuit comprising: a circuit configured to perform a motion search to select a motion vector; a circuit configured to determine a residual error for the motion vector with a plurality of macroblock modes; a circuit configured to estimate a coding cost associated with the motion vectors for at least some of the plurality of macroblock modes; and a circuit configured to select the mode for the encoding of the macroblock based on both the residual error and the coding cost associated with the mode." (Claim 15 has been analyzed and rejected w/r to claim 1. Figs. 6-7 illustrates a computer system and circuit, see also para. 0126).

Re claim 16, see discussion w/r to claim 2.

Re claim 17, "A video encoder embodying the circuit defined in Claim 15." (See figs. 6-7).

Allowable Subject Matter

5. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 10 further claims "...wherein a sum of absolute differences (SAD) calculation is used for the residual error, further comprising: adjusting the SAD calculation is made based on the coding cost for the mode to adjust the SAD calculation; comparing the adjusted SAD calculation for the mode to another adjusted SAD calculation for another mode; and selecting the mode with the

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lower adjusted SAD calculation[.]”, which is neither anticipated nor rendered obvious by the prior art of record.

Contact

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Le whose telephone number is 703-308-6613. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Chris Kelley can be reached on 703-305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Vu Le
Primary Examiner
AU 2613
(703) 308-6613
Vu.Le@uspto.gov